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Indian Standard
SPECIFICATION FOR
GRADING OF VISCOSE RAYON CUT
STAPLE FIBRES (REGULAR)

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INDIAN STANDARDS INSTITUTION
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Indian Standard

SPECIFICATION FOR GRADING OF VISCOSE RAYON CUT STAPLE FIBRES (REGULAR)

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Indian Standard

SPECIFICATION FOR GRADING OF VISCOSE RAYON CUT STAPLE FIBRES (REGULAR)

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 16 November 1970, after the draft finalized by the Silk, Man-Made Fibre and Products Sectional Committee had been approved by the Textile Division Council.

0.2 With the increase in the use of viscose rayon cut staple fibres in the different sectors of the textile industry, the demand for appropriate grade of fibre has arisen. This standard has, therefore, been prepared with the intention of clearly defining the various grades of viscose rayon cut staple fibres. It is hoped that this standard would enable the buyer to select the correct grade of fibre to suit his end requirement.

0.3 This standard is based on trade practices commonly followed in the country in this field.

0.4 Considerable assistance has been rendered by the Gwalior Rayon Silk Manufacturing (Weaving) Co Ltd, Nagda and South India Viscose Limited, Mettupalayam, in the preparation of this standard.

0.5 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS: 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard prescribes a method for grading of viscose rayon cut staple fibres (regular).

*Rules for rounding off numerical values (revised).

2. REQUIREMENTS — CHARACTERISTICS TO BE TESTED

2.1 The material shall be tested in respect of the following characteristics:

- a) Fibre length,
- b) Denier, and
- c) Dry strength.

2.1.1 The fibre shall be identified by the method prescribed in IS : 667-1955*.

3. SAMPLING

3.1 Representative material for testing the requirements shall be sampled according to 3 of IS : 4807-1968†.

4. ATMOSPHERIC CONDITIONS FOR TESTING

4.1 All the tests shall be carried out in a standard atmosphere of 65 ± 2 percent relative humidity and $27 \pm 2^\circ\text{C}$ (see also IS : 196-1966‡).

5. CONDITIONING OF TEST SAMPLE

5.1 Prior to test, the fibres shall be conditioned to moisture equilibrium in a standard atmosphere of $27 \pm 2^\circ\text{C}$ temperature and 65 ± 2 percent RH.

5.2 When the fibres have been left in such an atmosphere for at least 24 hours in such a way as to expose as far as possible all portions of the fibres to the atmosphere, they shall be deemed to have reached moisture equilibrium.

6. TEST METHODS

6.1 **Fibre Length** — Fibre length characteristics, such as mean length and effective length, shall be evaluated according to 6.2 of IS : 4807-1968†.

6.1.1 *Evaluation of Proportion of Overlong Fibres* — From the effective length obtained as in 6.1, add 5 mm if the declared staple length of the consignment is below 50 mm and 10 mm if the declared staple length of the consignment is above 50 mm to the effective length. Collect such fibres (from the oiled glass sheet) which are longer than the sum total of this length and weigh them. From this weight, calculate the percentage of overlong fibres in the consignment. Repeat the test once again and take the average of the two values as the percentage of overlong fibres.

*Simple methods for identification of common commercial textile fibres.

†Methods of testing viscose rayon staple fibres.

‡Atmospheric conditions for testing (revised).

6.1.2 Fibre Length Deviation—Calculate the fibre length deviation by the following formula:

$$F = \frac{100 (A - B)}{B}$$

where

F = fibre length deviation,

A = effective length, and

B = declared staple length of the consignment.

6.2 Denier—Calculate the denier of the fibres by following the method given in 6.3 of IS: 4807-1968*.

6.2.1 Deviation in Denier—Calculate the percentage deviation in denier by the following formula:

$$D = \frac{100 (A - B)}{B}$$

where

D = deviation in denier,

A = denier of conditioned fibre, and

B = declared denier of the consignment.

6.3 Strength—The dry strength of the fibres shall be determined according to 6.4 of IS: 4807-1968*.

7. GRADING

7.1 The material shall be graded into any one of the three grades depending upon the number of points obtained. For grading the material into Grade 1, the material shall receive more than 400 points. For grading the material into Grade 2, the material shall receive points from 300 to 400. For grading the material into Grade 3, the material shall receive points less than 300.

8. METHOD FOR AWARDED POINTS

8.1 The material shall be awarded points for the individual characteristics based on the details given in Table 1.

9. BASIS FOR ALLOCATION OF POINTS

9.1 Fibre length being the most important characteristic among all the characteristics from the point of view of spinning, it has been allotted the maximum number of points. Other characteristics have been allotted points in the order of their importance.

*Methods of testing viscose rayon staple fibres.

TABLE 1 METHOD OF AWARDDING POINTS

(Clause 8.1)

| CHARACTERISTIC (1) | POINTS (2) | POINTS (3) | POINTS (4) | POINTS (5) |
|--|---------------------------------------|---|---|-------------------------|
| A. When the Declared Denier is Below 2: | | | | |
| Extra long fibre, percent | 150 if 6.0 or below | 120 if between 8.0 and 6.0 | 90 if between 12.0 and 8.0 | 60 if beyond 12 |
| Fibre length (effective) deviation, percent | 150 if ± 6.0 and below | 120 if between ± 8.0 and ± 6.0 | 90 if between ± 10.0 and ± 8.0 | 60 if beyond ± 10.0 |
| Denier deviation, percent | 100 if up to and including ± 10.0 | 80 if between ± 12.0 and ± 10.0 | 60 if between ± 14.0 and ± 12.0 | 40 if beyond ± 14.0 |
| Dry strength on single fibre tester (g/d) | 100 if above 2.3 | 80 if between 2.15 and 2.3 (including) | 60 if between 1.9 and 2.15 (including) | 40 if below 1.9 |
| B. When the Declared Denier is Above 2: | | | | |
| Extra long fibre, percent | 150 if 6.0 or below | 120 if between 8.0 and 6.0 | 90 if between 12.0 and 8.0 | 60 if beyond 12.0 |
| Fibre length (effective) deviation, percent | 150 if ± 6.0 and below | 120 if between ± 8.0 and ± 6.0 | 90 if between ± 10.0 and ± 8.0 | 60 if beyond ± 10.0 |
| Denier deviation, percent | 100 if up to and including ± 10 | 80 if between ± 12 and ± 10 | 60 if between ± 14 and ± 12 | 40 if beyond ± 14 |
| Dry strength on single fibre tester (g/d) | 100 if above 2.0 | 80 if between 1.8 and 2.0 | 60 if between 1.6 and 1.8 | 40 if below 1.6 |

INTERNATIONAL SYSTEM OF UNITS (SI UNITS)

Base Units

| Quantity | Unit | Symbol |
|---------------------------|----------|--------|
| Length | metre | m |
| Mass | kilogram | kg |
| Time | second | s |
| Electric current | ampere | A |
| Thermodynamic temperature | kelvin | K |
| Luminous intensity | candela | cd |
| Amount of substance | mole | mol |

Supplementary Units

| Quantity | Unit | Symbol |
|-------------|-----------|--------|
| Plane angle | radian | rad |
| Solid angle | steradian | sr |

Derived Units

| Quantity | Unit | Symbol | Conversion |
|----------------------|---------|--------|---------------------------------|
| Force | newton | N | 1 N = 1 kg · 1 m/s ² |
| Energy | joule | J | 1 J = 1 N · m |
| Power | watt | W | 1 W = 1 J/s |
| Flux | weber | Wb | 1 Wb = 1 V · s |
| Flux density | tesla | T | 1 T = 1 Wb/m ² |
| Frequency | hertz | Hz | 1 Hz = 1 c/s (s ⁻¹) |
| Electric conductance | siemens | S | 1 S = 1 A/V |
| Pressure, stress | pascal | Pa | 1 Pa = 1 N/m ² |

INDIAN STANDARDS INSTITUTION

Manak Bhavan, 9 Bahadur Shah Zafar Marg, NEW DELHI 110002

Telephones : 25 60 21, 27 01 31

Telegrams : Manaksanstha

Regional Offices:

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